

1 1. A spread spectrum based multichannel modulation
2 UWB communication transceiver comprising:
3 a multichannel PN sequence mapping; and
4 a PN sequence look-up table.

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6 2. The transceiver of claim 1 wherein said
7 multichannel PN sequence mapping is used to generate 11-
8 multichannel UWB signal, with each of multichannel UWB
9 signal at the chip data rate of 650 Mcps.

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11 3. The transceiver of claim 1 wherein said PN
12 sequence look-up table produces 16-orthogonal spreading
13 sequence with 16-bit code.

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15 4. The transceiver of claim 1 wherein said 11-
16 multichannel produced from said multichannel PN sequence
17 mapping are all orthogonal each other.

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19 5. The transceiver of claim 1 wherein said number of
20 multichannel may be selected to produce the scalability
21 data rates for the UWB system.

22
23 6. A multichannel PN sequence mapping comprising:
24 a set of delay units; a set of down-sampling
25 units; and a set of XOR units to form the multichannel.

26

27 7. The multichannel PN sequence mapping of claim 6
28 wherein said delay and down-sampling units forms a set of
29 multichannel, which may be equivalent and implemented in
30 parallel.
31

32 8. The multichannel PN sequence mapping of claim 7
33 wherein said set of multichannel is equivalent to the
34 implementation structure of polyphase-based multichannel.
35

36 9. The multichannel PN sequence mapping of claim 8
37 wherein the analyzed sequence switch, which is equivalent
38 to the implementation structure of polyphase-based
39 multichannel, is a counterclockwise circuit that takes on
40 one of the positions with rotating at uniform speed.
41

42 10. The multichannel PN sequence mapping of claim 6
43 wherein the XOR units are used to perform a logic operation
44 to spread one-symbol with 16 PN chip sequences for the
45 entire multichannel.
46

47 11. The multichannel PN sequence mapping of claim 10
48 wherein said 16 PN chip sequences are orthogonal each other
49 for the entire multichannel.
50

51 12. The multichannel PN sequence mapping of claim 11
52 wherein said all of the multichannel are orthogonal.

53 13. A digital lowpass FIR shaping filter coupled to
54 the multichannel PN sequence mapping comprising:
55 a lowpass band;
56 a first transition band;
57 a second transition band;
58 a third transition band; and
59 a stop band.

60
61 14. The digital lowpass FIR shaping filter of claim 13
62 wherein said digital lowpass FIR lowpass shaping filter has
63 the lowpass band 0 - 0.26 GHz, the first transition band
64 0.26 - 0.325 GHz; the second transition band 0.325 - 0.39;
65 the third transition band 0.39 - 0.45; and the stop band
66 0.45 - 0.5 GHz.

67
68 15. The digital lowpass FIR shaping filter of claim
69 13 wherein said only one digital lowpass FIR shaping filter
70 is needed for the use in all of said multichannel.

71
72 16. A multichannel based multi-carrier modulation
73 comprising:
74 a analog lowpass filter;
75 a commutator unit; and
76 selectable multi-carrier frequencies.
77

78 17. The multichannel based multi-carrier modulation
79 of claim 16 wherein said commuter unit produces one of the
80 multi-carrier frequencies by controlling a switch.
81

82 18. The multichannel based multi-carrier modulation
83 of claim 17 wherein said selectable multi-carrier
84 frequencies contain all of the multichannel carrier
85 frequencies in which may be programmable to control the
86 multichannel.
87

88 19. The multichannel based multi-carrier modulation
89 of claim 17 wherein said switch can control to select some
90 of the multichannel carrier frequencies for use in the
91 transmitting data to avoid the interference with WLAN
92 802.11a.
93

94 20. The multichannel based multi-carrier modulation
95 of claim 19 wherein the transceiver may not use the fourth
96 or fifth and/or both of the channels for transmitting data
97 to avoid the interference with WLAN 802.11a by controlling
98 said switch.
99

100 21. A multichannel based multi-carrier down converter
101 comprising:
102 a analog bandpass filter;
103 a down converter unit;

104 a multichannel filter;
105 a commuter unit; and
106 selectable multi-carrier frequencies.

107

108 22. The multichannel based multi-carrier down
109 converter of claim 21 wherein said down converter produces
110 the multi-baseband signals by using multi-carrier
111 frequencies from the commuter unit in which is controlled
112 by using a switch.

113

114 23. The multichannel based multi-carrier down
115 converter of claim 22 wherein said selectable multi-carrier
116 frequencies contains all the multichannel carrier
117 frequencies that are programmable with scalability.